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Sustainability of the pension reform in Slovakia

Bachelor Thesis

Prague 2012

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Year: 2012

Bibliographic reference:

LIŠKOVÁ, Martina. *Sustainability of pension system in Slovakia*. Prague, 2012. 37s. Bachelor Thesis, Charles University in Prague, Faculty of Social Sciences, Institute of economic studies. Consultant: Tomáš Janotík

Abstract:

This paper explores the sustainability of pension system in Slovakia on the local institutional, socio-economic and political background, analyzing the past and current reforms and their impact on public finance. In the first, theoretical part of the paper, the World Bank strategy is sketched out to provide general framework for sustainability of reforms and their goals, and actual past reforms that took place in Slovakia from 2004 until present are dissected. These reforms are most notable for their reorientation from pure pay-as-you-go system to combined PAYG and fully funded system. While this step alleviates the crushing implicit social security debt to some extent, it is shown that not even the latest reforms alone will suffice to cover the increasing burden of the pension system on public spending. Therefore, in the empirical part of the paper, several parametric reforms are proposed and are analyzed from long term perspective (until 2100) using the World Bank PROST economic model. These scenarios approximately represent some of the reforms currently on the table that could be carried out in the near future. The varying inputs are retirement age, the contribution rate for the fully funded system, the replacement rate, the affiliation rate and the type of valorization, with the output being the deficit generated by the pension system each year and the cumulative deficit over the next 90 years. Each scenario is the discussed in detail, along with the effects the change of parameters will have on the deficit. The analysis implies that in order to achieve long term sustainability, severe cut-downs in the generosity of the pension system need to be made, along with other savings measures, such as increasing the retirement age further. In conclusion, these findings are then reconciled with the goals set in the World Bank *Averting the old age crisis* report, and challenges which might hinder the effort to attain these goals discussed.

Abstrakt:

Cílem této práce je vyhodnocení udržitelnosti penzijních reforem na Slovensku na daném institucionálním, socioekonomickém a politickém pozadí, prostřednictvím dopadu těchto reforem na veřejné finance. Teoretická cast se zaměřuje na úvod do problematiky. K tomu slouží jako podklad report Světové banky z roku 1994, který nastínil problematiku, a udal žádoucí směrování a základní cíle reforem. Dále se v úvodu rozebírají předchozí reformy slovenského penzijního systému, od roku 2004 až do současnosti. Tyto reformy jsou příznačné tím, že poprvé vnášejí do průběžného systému prvek spoření a představují tak první krok k nutným strukturálním reformám. I když tenhle krok vede k částečnému odhelčení systému od vysokého implicitního dlhu, je prokázatelné, že ani poslední reforma nestačí k stabilizaci výdajů a jejich čím dál tím drtivejší dopad na veřejné finance. V empirické části práce je analyzovaných několik převážně parametrických reforem, vybraných dle relevance a šance, že budou provedeny. Na reformy se nahlíží z dlouhodobé perspektivy (do roku 2100) a jejich analýza je provedena prostřednictvím modelu Světové banky PROST. Námi rozebírané scénaře představují návrhy vlády a mimovládních odborníků na řešení důchodové krize. Veličiny, které jsou proměnnými v modelu jsou věk odchodu do důchodu, výška příspěvku do II. pilíře, míra náhrady, míra, ve které lidi vstupují do spořícího systému a způsob valorizace důchodů. Výstupy, které jsou základem analýzy, jsou průběžný deficit prvního pilíře a dluh naakumulovaný důchodovým systémem k danému datu, po dobu nejbližších 90 let. Každý ze scenářů je jednotlivě popsán, prozkoumán a srovnán s ostatními, zejména z pohledu jaký bude mít daná konfigurace parametrů dopad na deficit. Z výsledků analýzy plyne, že i přes reformní snahu je status quo neudržatelný a pro stabilizaci jsou nutné šetřící opatření, například v štedrosti důchodů, nebo posunem hranice odchodu do důchodu. V závěru jsou tyto reformy, jejich snahy a cíle srovnány s laťkou a kritériami, která nastavila Světová Banka ve svém reportu *Averting the old age crisis* a spomenuty jsou taky problémy, kterým budou další reformní snahy muset čelit.

Keywords: Pension reform, sustainability, Slovakia, population aging, social security deficit, social security debt

Klíčová slova: Penzijní reforma, udržitelnost, Slovensko, demografická krize, stárnutí populace, deficit penzijního systému

Rozsah práce: 56,918 znakov

Prohlášení

1. Prohlašuji, že jsem předkládanou práci zpracoval/a samostatně a použil/a jen uvedené prameny a literaturu.
2. Prohlašuji, že práce nebyla využita k získání jiného titulu.
3. Souhlasím s tím, aby práce byla zpřístupněna pro studijní a výzkumné účely.

V Praze dne 20. července 2012 Martina Lišková

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Abbreviations

DB	Defined benefit
DC	Defined contribution
FF	Fully funded
PAYG	Pay-as-you-go
RR	Replacement rate
SIA	Social insurance agency
SSD	Social security debt
WB	World Bank

1. Introduction

Due to severe changes in demographic structure of population in the last few decades, pension system reform became a very topical issue in many countries across the world. Until recently, many countries relied heavily on various forms of PAYG pension schemes; however, given the increasing burden and rising costs associated with this system, various reforms were since proposed and even implemented to address the problem. We can divide such reforms into two main groups, depending on whether they were parametric or structural. Structural reforms change properties of the system completely – they include changes to institutional background and introduction of multipillar schemes to complement or substitute for the PAYG system. On the other hand, reforms are designated as parametric when only numerical changes take place; this can be change of retirement age, contribution rate, pension pay-out formulas etc.

After a brief introduction into the reform strategy, this paper focuses on pension reforms in Slovakia, a country which had already undergone a partial structural reform that will be described and analyzed in the theoretical part. With no more structural reforms being planned in the foreseeable future, in the empirical part, several proposed parametric reforms will be scrutinized and compared with the status quo, with an emphasis on sustainability.

1.1 Glossary of basic terms

Before tackling the problem of pension reforms and their sustainability let us first define several terms that will be used throughout the paper and their understanding is crucial for the clarity of the paper. Unless otherwise stated, all definitions are taken from the 1994 World Bank report *Averting the old age crisis*.

Defined benefit: a guarantee by the insurer or pension agency that a benefit based on a prescribed formula will be paid.

Defined contribution: a pension plan in which the periodic contribution is prescribed and the benefit depends on the contribution plus the investment return.

Full funding: the accumulation of pension reserves that total 100 percent of the present value of all pension liabilities owed to current members.

Implicit public pension debt: The value of outstanding pension claims on the public sector minus accumulated pension reserves.

Pay-as-you-go: in its strictest sense, a method of financing whereby current outlays on pension benefits are paid out of current revenues from an earmarked tax, often a payroll tax.

(System) dependency ratio: the ratio of persons receiving pensions from a certain pension scheme divided by the number of workers contributing to the same scheme in the same period.

Retirement age: the legal retirement age written into pension statutes.

Vesting period: the minimum amount of time required to qualify for full ownership of pension benefits.

Replacement rate: the value of a pension as a proportion of a worker's wage during some base period, such as the last year or two before retirement or the entire lifetime average wage. It also denotes the average pension of a group of pensioners as a proportion of the average wage of the group.

Moral hazard: a situation in which insured people do not protect themselves from risk as much as they would have if they were not insured.

1.2 World Bank Strategy

Being one of the first, most comprehensive and authoritative papers on the topic, the World Bank strategy proposed in its 1994 paper *Averting the Old Age Crisis: Policies to Protect the Old and Promote Growth* is to this day used as a general guideline and a

handbook for designing pension reforms. We will briefly summarize it, as it will be used to draw comparisons with reforms made in Slovakia and in the end used to evaluate whether the goals and criteria of success this report sets were upheld.

The World Bank recognizes the necessity of state involvement in the pension scheme, some of the reasons being shortsightedness and unwillingness or inability of some people to save for old age, insufficient availability of capital market instruments, and various other risks. Three main functions of a state managed pension system are outlined:

1) Redistribution – involving shifting lifetime income between workers, preferably from high-income to low-income workers, who have limited ability to save for old age from their lower wages
2) Savings – smoothing income over a person's lifetime, postponing consumption when they're young and have higher earnings to a period of lower income when they're old
3) Insurance – providing protection against economic recession, high inflation, bad investments, etc.

However, the World Bank report adds that a single, PAYG pillar (which was, or still is, the pre-reform case in most countries) is incapable of adequately providing all these functions. Therefore, a three-pillar model is proposed instead. The first pillar remains a solidarity-based PAYG scheme, financed from taxes and ensuring every retiree receives a certain minimum pension. However, this should not be the only and main component. For this reason, an additional, second FF pillar is introduced. The pillar should be privately managed, but regulated by government in order to prevent moral hazard and speculative, risky investing. The benefits are actuarially linked to contributions and costs, thus avoiding possible distortions due to legislation change. Additionally, the presence of a fully funded pillar is expected to boost the economy via capital accumulation. The final, third pillar is introduced as a voluntary addition, based on same principles as the second pillar. This scheme separates the redistribution (I. pillar) and savings (II. and III. pillar) functions of a pension system, but provides the insurance jointly through all three pillars. For a concise summary, see figure 1.

Figure 1: Summary of the World Bank Strategy

	I. pillar	II. pillar	III. pillar
Description	Mandatory publicly managed	Mandatory privately managed	Voluntary privately managed
Objectives	Redistributive plus coinsurance	Savings plus coinsurance	Savings plus coinsurance
Form	Means tested, minimum guarantee or flat	Personal savings plan or occupational plan	Personal savings plan or occupational plan
Financing	Tax financed	Regulated fully funded	Fully funded

Source: World Bank (1994)

1.3 Social security debt and the pension system

Many pension schemes across the world are maturing. Holzmann et al. (2004) point out that most of them are unfunded – while the obligations to pay out pensions exist, no assets were set aside to pay for them. The present value of these liabilities is not reported, nor is it explicitly obvious or easily determined. The exact value for each country depends on many variables that are featured in the DB formula within its pension system and the demographic structure. For this reason, such debt is referred to as implicit. However, once the transformation from PAYG to FF scheme begins, the implicit debt turns explicit, as the old system loses contributors who instead save in a FF pillar, but still has to pay out obligations to current pensioners.

When considering a reform of the system, the implicit SSD estimation is crucial for several reasons. Holzmann et. al (2004) list two of them:

The initiation of a pension reform. The recent trend, especially in European Union[1], has been going in the direction of counting the implicit debt towards the explicit debt, as they share several similarities. Another concern is sustainability; if fiscal stability is to be achieved, implicit debt should be taken into account in the macroeconomic analysis. Looking merely at projected expenditures and revenues of reformed and unreformed system does not suffice, since these can

[1] For literature review, see Disney

be distributed over an extended period of time, thus showing little apparent immediate improvement, but such a reform might radically decrease the implicit SSD and aid in overall long-term sustainability. In order to reflect this, determination of the amount of SSD plays an important role.

Assessing pension reform. Once the reform has been launched, it is prudent to have an estimate of the implicit debt due to the fact that in the transitional period, a part of the debt will become explicit. Ordinary budgetary financing might be out of question and in order to estimate the total costs of transition, an accurate SSD figure is needed – debt financing in some cases might be justified, in order to distribute the vast costs of transition between generations, in order to avoid excessive tax increases and consumption reduction (Holzmann, 1998).

2. Slovakia

2.1 Pre-reform pension system

Before the first pro-reform steps were launched in 2004, the entire pension system was based on DB PAYG principles and participation was mandatory for all citizens. The pension scheme was funded through payroll taxes; the total amount paid equaled 26.5% of gross salary in 1995 and rose to 28% in 2003. The vesting period until eligibility was 25 years. The retirement age was set at 60 for men and 53-57 for women (depending on children raised) for the majority of population, with the exception of military and hard laborers whose retirement age was even lower. To calculate the benefits, a five-year average was used, with the reference wages selected from the last ten years before retirement, in which the individual achieved the highest. This average was the base of further assessment according to the following brackets (see figure 2). This allowed for a maximum of 4,067 SKK as a basis for assessment.

Figure 2: Social Security brackets

Base of benefit assessment (SKK)	Percentage counted towards the base for

	pension assessment
0-2,500	100%
2,500-6,000	33%
6,000-10,000	10%
>10,000	0%

Source: Ministry of Finance

The formula for determining the actual amount of benefit paid included also coefficient of domestic average wage increase and after 1991 also valorization mechanism (which was however not index or inflation linked - every year, a new law determined how much the pensions would increase. This mechanism was thus often abused as part of political agenda). Such setup became problematic in 2002, when the average gross salary in Slovakia was 13,500 SKK but the pension benefit valuation cutoff remained at 10,000 SKK. In effect, this meant workers with low wages had a much higher replacement rate than those earning higher wages. Unsurprisingly, this led to tax evasions and a substantial drop in motivation to pay social security contributions.

Figure 3: Pre-reform pension overview

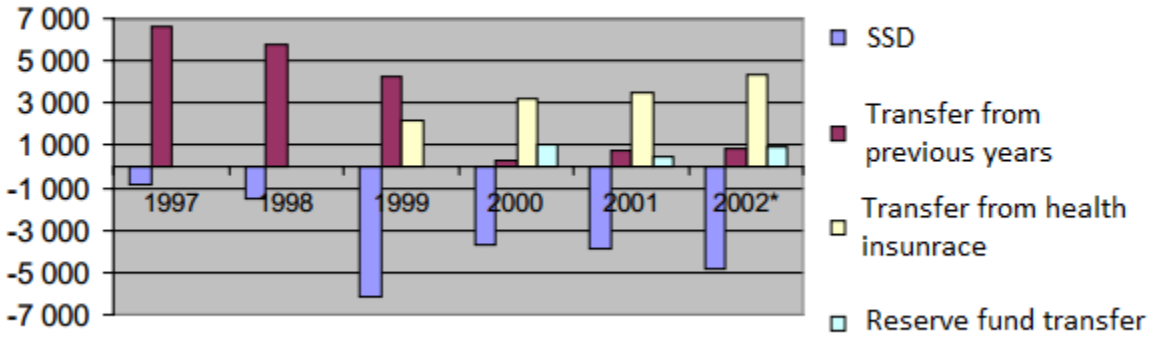
Year	Average pension		Nominal pension growth (%)	Inflation rate (%)	Real pension growth (%)
	SKK	EUR			
1994	2,928	97	-	-	-
1995	3,184	106	8.7	9.9	-1.1
1996	3,757	125	18.0	5.8	11.5
1997	4,155	138	10.6	6.1	4.2
1998	4,521	150	8.8	6.7	2.0
1999	4,908	163	8.6	10.6	-1.8
2000	5,412	180	10.3	12.0	-1.5
2001	5,812	193	7.4	7.1	0.3
2002	6,133	204	5.5	3.3	2.2
2003	6,531	217	6.5	8.5	-1.9
2004	7,046	234	7.9	7.5	0.4

Source: Ministry of Finance, SR

As the population growth subsided, and the number of contributors relative to beneficiaries decreased, the scheme ran into financing problems, as is often the case with PAYG based systems. Between 1997 and 2004, the deficits became an annual occurrence. While these

were covered by transfers from other funds and state assets (Figure 4), their slowly increasing nature indicated that they were a systemic problem and it became obvious that a structural reform would be required to solve this problem.

Figure 4: SSD and its coverage



Source: Golias, 1994

2.2 2005 Pension reform

2.2.1 Overview

In 2005, the social security system underwent a complete overhaul. A three-pillar system was established with the following properties:

Figure 5: Overview of multi-pillar system after the 2005 reform

	I. pillar	II. pillar	III. pillar
Form	PAYG	Fully funded	Fully funded
Financing	Tax financed	Tax financed	Savings
Management	Public	Private	Private
Contribution	Mandatory	Optionally mandatory [2]	Voluntary
Pension benefits	Dependent on length of contributing period, reference	Dependent on amount of money accumulated in the account	Dependent on amount of money accumulated in the

[2] Individual can decide to stay in PAYG system (default) or to switch to multi-pillar system. In case of latter, mandatory contributions to the pension system get split 50/50 between I. and II. pillar.

	wage		account

An important part of the reform consisted of increasing the retirement age to 62 for both men and women by means of annual raises of 9 months until the benchmark was reached. Because of previously mentioned difference in ages of retirement for men and women, this meant the target would be achieved by men in 2006, while women should have unified retirement age by 2015.

One of the most important changes the pension system underwent was establishing a clear and significant link between the size of contributions and length of employment and the benefits received. This provided incentive to pay social security contributions in full and decrease the amount of speculation and avoidance of paying into the system. It also meant that in short term, the amount of contributions poured into the system increased, thus solving immediate problem deficits of the system – as of 2005, there was no need for transfers from other public funds to social security, since no deficit was produced[3] (see Fig. 6).

Another crucial change was the establishment of ownership rights in the FF pillar. This brought the possibility of the savings becoming part of inheritance proceedings, which is not possible in DB PAYG system. Eligible to join were all workers with more than 10 years until legal retirement age – those who had less than 10 years were fully covered under the existing PAYG pillar.

2.2.2 Sustainability

Figure 6: The deficits of social security

(mil EUR)	2005	2006	2007	2008	2009	2010
Transfer from SIA[4] to PMPF[5]	305	606	750	815	744	776

[3] IFP (2004): Vplyv dochodkoveho sporenia na verejne financie a obcanov
[4] Social insurance agency
[5] Privately managed pension funds

Transfer from other public finances to SIA	0	637	671	568	875	1517

Source: Ministry of Finance of SR, 2010

After the reform, deficits in PAYG pillar were manageable – the first year after the reform, the PAYG pillar was completely self-sustaining. As seen in Fig. 6, in 2005, no additional capital injections were necessary to keep social security budget balanced. In the period of 2006-2008, a liquidity shortage appeared due to transfer of money from the state insurance company to private pension funds, proportionate to the number of participants in the FF pillar, managed by private companies. These transformation costs were predictable and expected. The capital injections the State Social Insurance company received did not exceed the outgoing transfers to private pension funds – as of 2008, discounting the influence of the FF pillar, the PAYG system didn't produce deficits. The first problem occurred in 2009, when the incoming transfers exceeded the outgoing transfers, meaning that the social security tax was no longer sufficient to cover the increasing needs of the pension system. Since then, the difference only grew wider and needs for a new reform became more acute.

3. Search for sustainable pension scheme

Sustainable level of pension scheme deficit will henceforth be considered at 1% of GDP annually, which corresponds with the estimated costs of transformation from PAYG to multi-pillar system (INEKO, 2010). This level of social security deficit will therefore be considered acceptable in all further calculations. In the search for a suitable model, we will compare several scenarios that are most often suggested in academic and political circles as a possible pension reform.

The simulation used in this particular thesis was designed by INEKO, a Slovak economic think-tank, and is based on the World Bank designed model PROST (Pension Reform Option Simulation Toolkit), which is widely used to make quantitative estimations about different pension systems worldwide. It is a data intensive model that can be, through careful choice of data fed into it and parameter manipulation, adapted to suit each country's unique circumstances. In our case, the simulation period is from 2010 to 2100, as we are looking for a long-term sustainability.

The model works by calculating the population growth and structure, based on mortality and natality data (EUROPOP, 2010) and immigration estimates (Vyskumne demograficke centrum,

2010). The result is a population matrix which gives the amount of people of ages 0 – 100 for each year in the period 2010-2100. The entire population is then divided based on two independent criteria:

1. Contributors and non-contributors, where the number of contributors is

$$C = LP * (1 - u)$$

where C is the number of contributors, LP is labour participation rate and u is the unemployment rate, and everyone else is considered a non-contributor.

2. Beneficiaries and non-beneficiaries; the sum of beneficiaries of the system is the sum of those receiving retirement pensions and disability pensions.

The revenues of the system are calculated using the number of contributors and similarly, its expenses are determined by the number of beneficiaries. Other key input data include prognosis of wage and pension distribution until 2100 (Statistical Bureau of Slovak Republic, 2004) and macroeconomic data prognosis regarding real GDP growth rate and work productivity growth rate (INEKO, 2010).

The outputs of the model are annual deficits generated by the PAYG system and total debt accumulated since 2010 to date. The deficit is calculated as the difference between amount received and amount paid out, plus the net transfers from other public funds to social security. Furthermore, the debt is calculated as

$$Debt_t = Debt_{t-1} * (1 + r) + PAYGDef_t$$

where *r* is the real interest rate and PAYGDef is deficit generated by the pay as you go system in year *t.* Due to unavailability of reliable data prognosis for the real interest rate, or a government plan of financing the deficit created by the pension system, the model assumes r=0 for better simplicity. It should be noted that this will most likely not be the case, and as is discussed in further sections, the interest rate in Slovakia has been historically positive[6], leading to understatement of debt which is accumulated.

[6] See Figure 13 for historical benchmark government bond rates.

The model is then used to evaluate four scenarios, each with different parameters (Fig 7, column 1 and 2).

Figure 7: Variable model parameters

Parameter	Allowed range	Current pension system
• Replacement rate	0-100 %	100 %[7]
• FF scheme contribution rate	0-100 %	9 %
• Affiliation rate	0-100 %	40 %[8]
• Valorization mechanism	Swiss or Inflation based	Swiss
• Retirement age	62, 65, 67, 70, 75	62

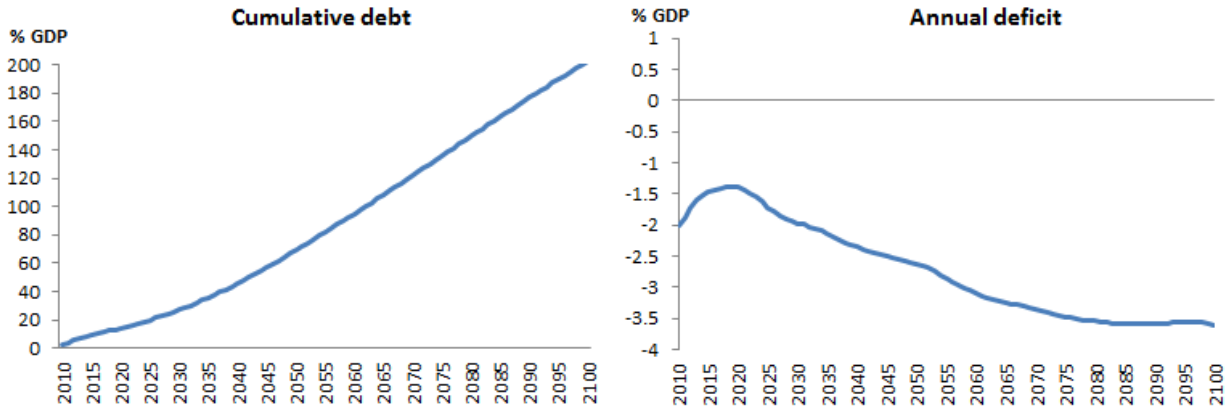
The first scenario is a reflection of the current system, as of May 2012 (Fig. 7, column 3). Scenario 2 and 3 vary only slightly, with the only difference being in replacement rate. The parametric configurations were chosen so they would best approximate current proposals of the government which are being proposed as the response to the increasing PAYG pillar deficit and the looming old age crisis. The fourth scenario is a collection of suggestions from various economic experts and think-tanks, who claim they are the necessary for long term stability of the pension system. For detailed description of each of the scenarios, see Section 3 of this paper.

[7] Indexation using the year 2010 as basis. The replacement rate in 2010 was on average 45,7%, this represents 100%

[8] Until recently, the participation in the FF pension scheme was mandatory for all new labour force entrants, making the affiliation rate 100%. However, the law has since been revised and this is no longer the case.

3.1 Scenario 1:

Figure 8: Scenario 1 - Projected debt and deficit



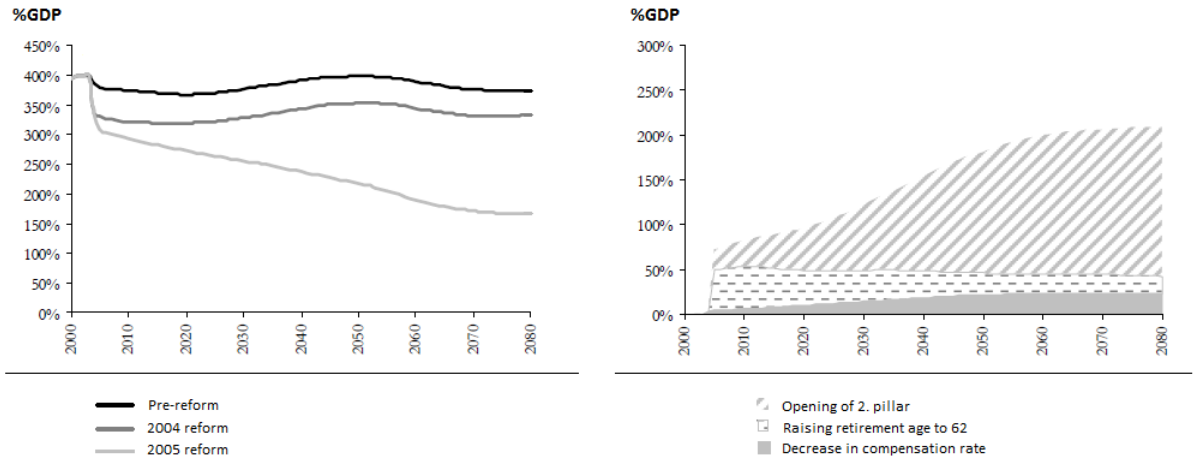
Retirement age	62 years
Index valorization	Wage and inflation
New replacement rate as percentage of old RR	100%
Contribution rate into the II. Pillar	9%
Affiliation rate:	40%

For this scenario, parameters of the current system are used as a basis. This gives us a good approximation of its behavior and an estimate on how it will evolve if all attempts to further change the system ceased. As we can see, the current system, despite the steps that were already taken to ease the burden of SSD, is insufficient from long term perspective and is still in need of improvement to achieve the goal of sustainability. While it will provide relief in medium-term (period of the next 10-15 years), it is not sufficient to avert the trends of population aging and its deficit will, according to the model, exceed 2% already in 2031 and will only increase onwards. This will in turn cause the cumulative debt to spiral out of control. It could potentially reach 70% of GDP by year 2050 and 150% GDP by 2080. Even without interest expenses, such excessive debt (in addition to the already existing and ever-increasing debt of 41.1% of GDP as of 2011) is well above sustainable levels and long before these levels could be reached, Slovakia would face bankruptcy and drastic measures such as complete abolition of PAYG pension system or its stripping down to bare minimum would have to be undertaken.

One of the most perplexing features of this system is indexation partially dependent on wages, a so called “swiss” model of valorization, which is something of a luxury and is not easily defensible logically – once the rent has been calculated for a worker, based on his wage and length of active working period, there is little reason to increase this rent in his retirement age other than maintenance of his living standard, or in other words, in case of positive inflation rate. The World Bank (1994) even suggests this as a solution to help maintain costs of pension system in short-to-medium term. This measure keeps the benefits the same in absolute, real terms, but not in relative terms. Such a strategy, however, reduces the average replacement rate.

Overall, the swiss indexation represents a luxury that can only be maintained in countries with high birth rates or countries where productivity due to technology is sufficiently high or rising rapidly. It is an advanced form of inter-generational solidarity, where those of working age share part of their increasing wealth (rising wages) with those not in the labor force. However, this is only possible as long as the pension taxes collected not only cover the expenses, but produce a surplus. Given the demographic situation in Slovakia, further discussed in section 5.1, and the deficits the social insurance produces (Figure 6), it is clear that this form of indexation produces excessive strain on the pension system. Also, even though the retirement age was recently raised and is still converging towards the benchmark 62 years, it is already becoming clear that with the rising life expectancy, this will not suffice to stabilize the system and further increases will be necessary.

Figure 9: Estimated implicit SSD comparison before and after the reforms

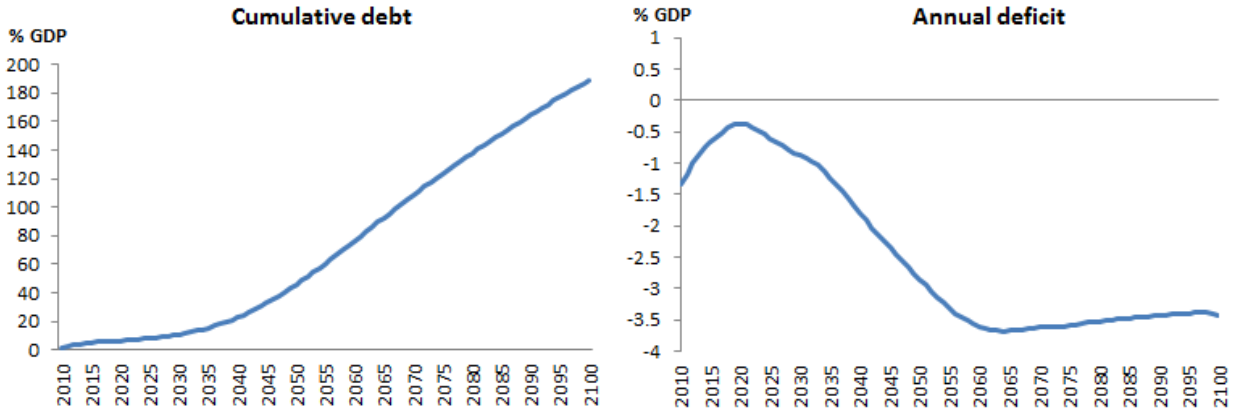


Source: IFP, 2004

Interestingly, according to the IFP (Fig. 8), this is accompanied by decrease of implicit SSD in approximately the same value; while the explicit debt will rise by around 140% (from 0 in 2010 to 140% in 2080), the implicit debt should fall by the same amount: from 300% in 2010 to 170% in 2080).

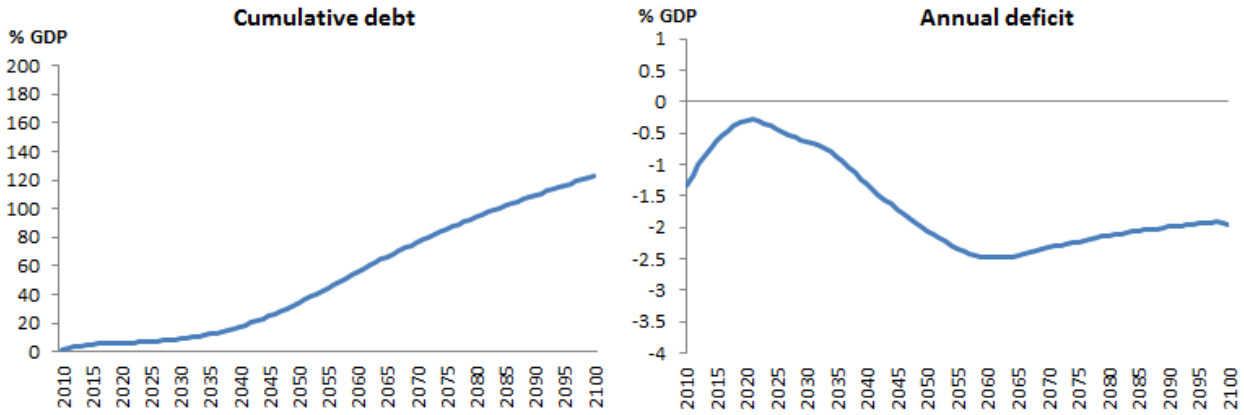
3.2 Scenario 2 and 3:

Figure 10: Scenario 2 - Projected debt and deficit



Retirement age	62 years
Valorization	Inflation
New replacement rate as percentage of old RR	100%
Contribution rate into the II. Pillar	4%
Affiliation rate	40%

Figure 11: Scenario 3 - Projected debt and deficit



Retirement age	62 years
Valorization	Inflation
New replacement rate as percentage of old RR	80%
Contribution rate into the II. Pillar	4%
Affiliation rate:	40%

Let us explore two scenarios, considered and proposed by the current ruling party. The most obvious and least damaging change in parameters is the switch from swiss indexation to purely inflation based indexation (scenario 2 & 3). This would help slightly reduce the accrued-to-date liabilities and thus ease the pressure of the SSD. Another change is a considerable reduction of contribution rate from 9% to 4% (scenario 2 & 3), and cancellation of the indexed fund, which has the lowest management fees. While the latter may be perceived as a structural change rather than parametric, it should be mentioned, since both of these steps cause a meaningful reduction in the present value of the pension savings, which constitutes a serious disturbance in conditions which were in effect when the participants were entering the system.

Constitutionally, such severe changes make the re-opening of the II. pillar unavoidable, making it possible for workers to quit the system if they wish to. This also introduces insecurity into the multi-pillar system, given that previously, the total contribution from employer and employee was split equally between the two pillars. Consequently, the contribution from the

PAYG pillar towards the pension would be 50% of the full benefit that would otherwise be paid. However, since due to the proposed change, the ratio of contribution between pillars will change from 1:1 to 7:2 in favor of the PAYG pillar, it also stands to reason that the contribution from PAYG system will have to be set higher, to compensate for the lost savings from the FF pillar. How the Slovak government intends to finance this pillar remains unclear. The constant changes to the system, both parametric and structural, often not taken to their logical conclusions (prognosticated failure to stabilize the deficit and skyrocketing debt), lead to uncertainty and affect the ability of an individual to make a rational decision regarding their pension security. Most of the proposed changes make the FF pillar less attractive, which will likely cause a net reduction of contributors in this pillar, negatively affecting the affiliation rate.

All these factors combined indicate a drop of significance of the fully funded II. pillar and return to PAYG scheme, which can only be interpreted as a step backwards. As *Figure 10* implies, the government favors short-term relief of public finance over long-term solution and the result is, as time progresses, very similar to the current system's prognosis (scenario 1): a deficit generated at a rate comparable to the current system, sometimes slightly lower (period 2012-2047), at other times somewhat larger (period 2047-2080). The deficit will hover between -1% and -0,4% between years 2012 and 2033, but as the population grows older, the deficit could rise to as much as -3.5%. This will result in a very similar evolution of the total debt as under the current conditions, with similar end result of inevitable bankruptcy, showing a clear lack of concept from the government for dealing with the old age crisis. Another proposed parametric change is, in addition to the aforementioned adjustments, the reduction of replacement rate by 20% (scenario 3), which given the ruling party's socialist rhetoric, could prove to be very difficult to actually put into practice. Decreasing the pensions directly would go against the core of their own electorate and could cause social turmoil, given that the replacement rate lowers. Therefore, this step will likely be carried out indirectly, through the freezing of indexation for a year or two and effectively lowering the pension in real terms through inflation.

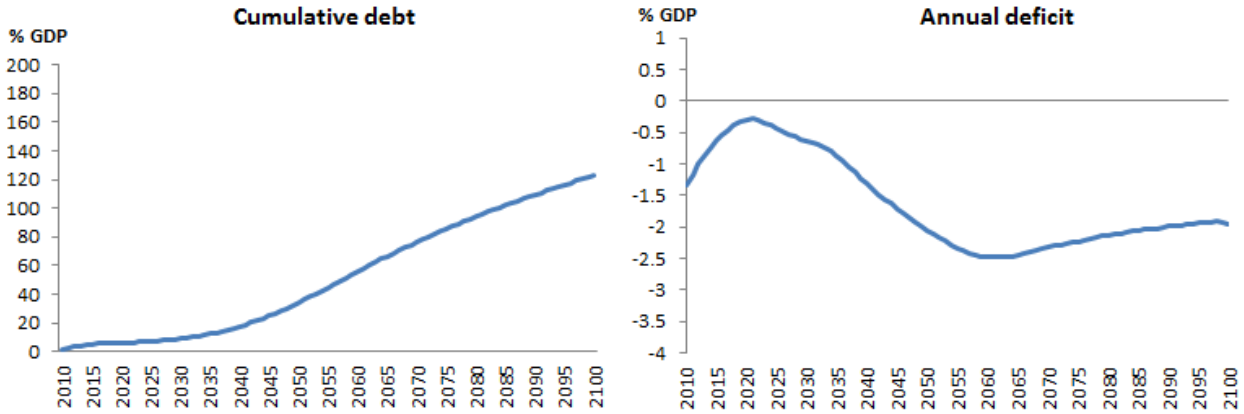
So far, a more moderate alternative was announced[9] – a fixed, lump sum increase, which would just barely compensate the inflation for the lowest-pension earners and not suffice to compensate it for everyone else, making this the first step towards lowering the real term pension. Even though in the short run and medium run, this may suffice to keep deficit and debt

[9] source

at manageable levels, it will not solve the problem, merely postpone it. By year 2040, the debt resulting from the pension system alone will rise to 17.5% and from there it will accelerate, reaching 80% in 2072 and 120% in 2100. Depending on how much debt are the future governments willing to take on, this ad-hoc reform could stall the problem for 10-20 years, when an overhaul of the pension system would become inevitable.

3.3 Scenario 4

Figure 12: Scenario 4 - Projected debt and deficit



Retirement age	65-70 years
Valorization	Inflation
New replacement rate as percentage of old RR	80%
Contribution rate into the II. Pillar	8%
Affiliation rate:	100%

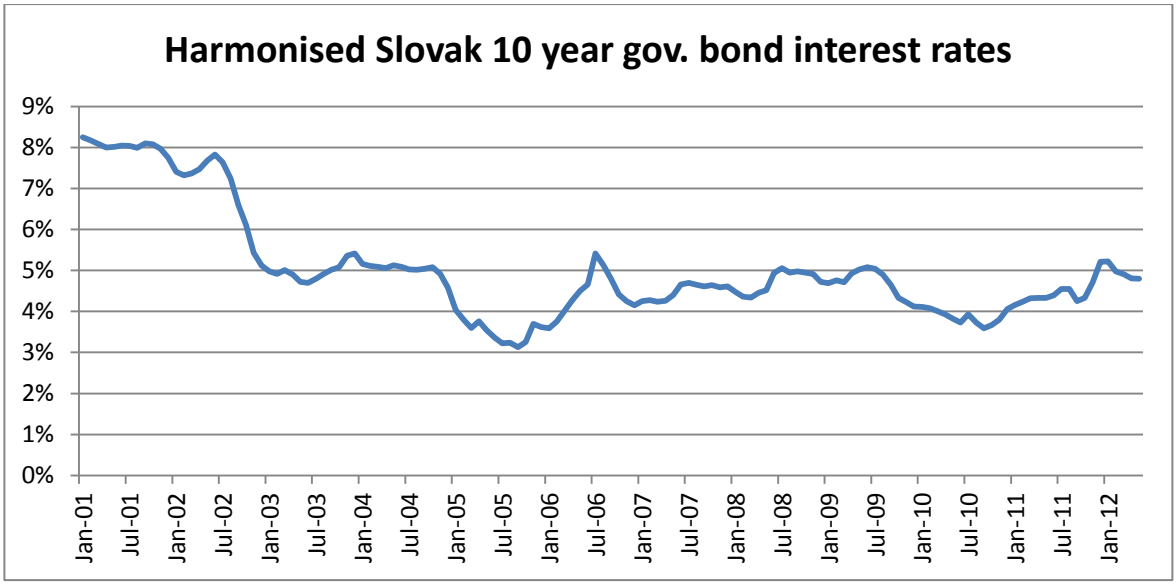
One of the proposed models (scenario 4) includes linking the retirement age to average life expectancy, changing indexation to inflation only, lowering the replacement rate, slightly cutting the contribution rate into the FF pillar to 8%, and making participation in it obligatory for all new entrants into the labor market. With these parameters, the model almost suits our criteria of sustainability: after the initial "shock-period", the deficit stabilizes around year 2060 and given enough time, the PAYG pillar will start showing surplus – this is mainly due to the fact that as time

progresses beyond 50 years, assuming predicted life expectancy and 100% affiliation rate (mandatory entry into the FF pillar), there will be less and less pensioners relying solely on the PAYG scheme, which would lift a considerable burden. As can be seen on Fig. 11, annual deficit will keep falling into the red numbers in the transitional period when SSD turns explicit and before the FF pillar starts paying out benefits. The deficits of PAYG pillar will actually continue to increase until 2060, when they reach their peak at estimated -1.7%. Unlike in the previous three scenarios, where the deficits spiral out of control, in this case, the trend will eventually turn around and the deficit will stabilize. However, until then, the government will have to find mean to finance this debt, which will undoubtedly be a challenge considering the negative outlook for the EU economy and financial markets.

4. Discussion and comparisons

Even after the 2005 reform, the current multi-pillar pension system (scenario 1) is unsustainable. Every year, the forecast deficit is well over the 1% which was deemed sustainable. Ceteris paribus, the cumulative debt could reach 70% of GDP by 2050 and 200% GDP in 2100. As it is a reasonable assumption that a part of this debt would have to be financed via borrowing on financial markets, the estimated amount could rise further due to non-negligible debt service costs. Since the start of the financial crisis in 2008, the interest rates on 10yr Slovak government bonds mostly stayed inside the 4-5% (Figure 12) band, which puts Slovakia's long-term bonds into the territory of speculative investments.

Figure 13: Harmonised Slovak 10yr government bond interest rates



Data source: ECB, 2012

As can be seen from all four scenarios, (Figure 8,10,11,12), the FF pillar actually worsens the pension deficit before year 2060 as evidenced from the small bump; however, after this critical period, it contributes to significant improvement in the overall balance of the pension system. This is best illustrated in Fig. 12, where the deficit actually becomes a surplus.

Several modifications to the current system were proposed, among them the most obvious – changing the indexation of pension paid out of the I. pillar from the Swiss model (scenario 1) to purely inflation-indexed pension (scenario 2-4). Another proposal from the current government entails rejecting indexation altogether and only valorizing the pension by a lump sum – this would in effect mean valorization that is regressive with respect to the size of an individual's pension. Such a measure could help save considerable amount of funds from the PAYG pillar, delaying its collapse. However, it would remove the link between contributions into the system and the payout, thus undermining the merit based system, which was hailed as a major improvement of the earlier reform and served to increase the workers' motivation to pay their social security taxes as mentioned in section 2.1.

Another inevitable change to the system in order to make it sustainable is an increase of the retirement age from current 62 years. As demonstrated, sustainable state can only be achieved via synergy of several cuts and saving measures, one of them being an increase of

retirement age to at least 65 years, ideally with link to average life expectancy. It is unlikely those conditions will be met, considering the plans of the government to repeal the law making entry into the FF pillar compulsory for all new entrants into the labor market and the intention to lower the contribution rate to 4%, it would mean that even an increase of the retirement age to 65 would not suffice to stabilize the retirement system in the long run. Given that any rise of retirement age is usually accompanied by social upheavals and protests, it is a very politically sensitive topic and a sudden or significant increase could prove to be unfeasible, further complicating the consolidation of the pension system.

The last mentioned (and most direct) means of consolidation that was discussed is change in the replacement rate. Precisely because this measure is so direct and immediately visible it is an unpopular measure among politicians. This is related to the already mentioned valorization mechanism change – in case of lump sum valorization, for a large amount of retirees, this would constitute a percentual increase that is lower than the inflation rate, translating to a pension decrease in real terms. While this model does not reflect this particular possibility, if practiced for a number of years, the replacement rate of retirees with higher pensions would gradually fall.

5. Compliance with WB strategy

We have described the reform and analyzed its long-term sustainability (as scenario 1), we may now look to what extent does the reform comply with the strategy outlined in World Bank report *Averting the Old Age Crisis*.

At first sight, the structural part of the reform copies the advised strategy almost exactly. In the Slovak reform, there are three pillars, each functionally matching the corresponding WB pillar[10]. The first pillar, based on pay-as-you-go, is almost identical to the proposed WB pillar. However, at closer look, there are differences. The WB strategy suggests that the PAYG pillar should be gradually phased out, providing only basic, minimum income to everyone, based on inter- and intra-generational solidarity. The PAYG component of the Slovak reformed system can be divided into two subcomponents; first, the minimum and welfare pension for those who save in the FF scheme, and second, the old system pension, which provides benefits for those who

[10] For details, compare Figure 1 and Figure 5.

chose not to switch. While the fist component matches the WB recommendations, the Slovak government shows no signs of plans to phase out the PAYG pillar's function as sole provider of pension for those retirees who are not participating in the FF scheme. Since participation is no longer obligatory for new entrants in the labour force, unless the legislation changes, this trend will continue and PAYG pillar will be the sole source of pension for some retirees even in the future. This step is a diversion from the WB strategy, which suggests gradual, complete phasing out of PAYG pillar as the main source of pension. While this was initially the idea behind the 2004/5 reform, the planned 2012 changes (scenario 4) will shift the burden back to the PAYG system, reversing the progress made in this field.

The second, FF pillar is also designed with the WB strategy in mind. The contradiction happens in case of regulation. The World Bank policy disapproves of requirements invest in public sector funds – this was an issue in 2009, when the government passed a law requiring non-negative yield guarantees and set minimum percentage of holding that needed to be invested in public sector bonds. In an effort to sanitize budget in 2012, the government has been threatening to nationalize the pension savings. If such measure were to be taken, it would mean complete dismantling of the pension reform from 2005.

The third pillar of the WB strategy consists of voluntary savings. While this pillar is still active, absence of incentives (such as contributions from employer, or tax deductibility of contributions into III. pillar) has caused this pillar to lose popularity.

As for the functions of public pension system proposed by World Bank, no comment will be made regarding the system's role in redistribution and smoothing income over time due to lack of data. However, the insurance factor is failing due to the government attempting to bring down the value of its obligations towards pensioners via inflation[11] - a strategy that has been criticized even by the government institution and economic think-tank IFP[12]

[11] Cavojec, J: Dochodky sa budu zvysovat o pevnu sumu. SME. Available as of 15/05/2012 at http://ekonomika.sme.sk/c/6377040/dochodky-sa-budu-zvysovat-o-pevnu-sumu.html

[12] Porubsky, M (2012): Indexacia dochodkov o pevnu sumu? Nie, dakujem. IFP. Available as of 15/05/2012 at http://www.finance.gov.sk/Components/CategoryDocuments/s_LoadDocument.aspx?categoryId=8191&documentId=7193

To sum up, while Slovak reforms do not yet fully comply with the WB strategy, they have started in the right direction. Whether they are brought to their conclusion remains to be seen. The biggest threat to successful pension reform is the current government, which keeps introducing uncertainty into the system by making audacious claims, cutting contribution rates and passing legislation which instead of protecting the pension savings of the population serves to temporarily plug holes in the government budget.

6. Challenges

6.1 Demographics

The size and age structure of the Slovak population will change considerably over the next decades due to low fertility rates and continuous increases in life expectancy, leading to substantial pressures to raise public spending on pensions. Past reforms of the pension system that combined parametric changes to the pay-as-you-go, defined benefit scheme (the first pillar) with the introduction of a fully funded defined contribution scheme (the second pillar) have led to significant improvements in the long-term balance of the DB pillar, while at the same time considerably reducing the redistributive elements of the system. Recently, a number of modifications were introduced to the pension system, which have tended to decrease the importance of achievements regarding the lowering of future pension costs. Those currently in the system have been given two opportunities to shift between the pillars, while for new labor market entrants participation in the DC pillar was changed from compulsory to voluntary.

The result is likely to be movement out of the DC pillar and into the DB one. These measures, along with an increase in the ceilings for pension contributions, have led to a rise in revenues of the DB pillar. With more people relying on the pay as you go model, the demographic crisis becomes more relatively significant and more severe in consequences. To evaluate what lies ahead, let us look at several statistics often used to illustrate the impact which population aging will have on social security sustainability:

Aging ratio = $\frac{population\ 65+}{population\ 0-14} * 100$. This index does not directly reflect the burden on the pension system. However, it is still a relevant statistic - when the ratio rises, it foreshadows increase in the dependency ratio year later, as those younger populations grow older and enter the labor force.

Dependency ratio = $\frac{population\ 65+}{population\ 15-65} * 100$. This index measures the ratio of those not in the labor force, typically the beneficiaries of a pension system and those who are usually economically active. It is a good measure of the burden on the economically active population in case of pension systems with PAYG component.

Figure 14: Slovakia's demographic prognosis

Year	Avg. age	Aging ratio	Dependency ratio
2005	37,41	70,74	39,54
2010	38,84	66,30	38,09
2015	40,09	77,98	41,45
2020	41,30	90,99	47,53
2025	42,60	103,86	51,90

Source: Vano and Bleha (2007)

Fig. 13 further demonstrates the widely observed and acknowledged phenomenon of population aging, prevalent in most developed countries. As Vano and Bleha (2007) note, while in 2005, there were only 39 pensioners per 100 people in working age, in 2025, there will be almost 52 citizens over 65 years, which signifies a predicted increase of whopping 31.3% over the period of 20 years. This will place additional burden on the pension system. As the number of contributors decreases and the number of beneficiaries increases, the amount of contributions will, by laws of simple mathematics, have to increase, or the pensions paid out will have to decrease. However, just as the social security tax cannot be increased indefinitely, the benefits cannot be reduced below a certain minimum "sustenance wage", defined as the minimum income necessary to provide for shelter, food and basic human needs. Therefore, there is pressure to solve this issue before either the social security tax increases so much it will become increasingly prone to tax avoidance, or before the pensions decrease below this critical threshold of minimum sustenance amount.

6.2 Policy risk

As described in previous chapters, the intrusions into the system since 2004 were manifold, both parametric and structural. Since then, practically every year there were either changes to the social security taxes (contribution rate changes, social security tax ceiling increases), new regulations for the privately managed pension funds (limits for equity investments, maximum fees, minimum guarantees), increase in the pension age and ad hoc adjustments to the benefit size. With a plethora of new changes proposed, some of them inconsistent with the previous government's direction (such as decreasing the importance of FF scheme in favor of PAYG scheme), the distortions are making any rational economic calculations increasingly difficult, both for economic institutions trying to predict and estimate the future direction of pension system and its costs, and for individuals trying to choose the best alternative for their pension. There has also been talk about nationalization of savings in the FF pillar, either by direct seizure or by forcing the insurance companies via legislation to buy Slovak government bonds. Such claims and irresponsible behavior reduce the trust of current participants and potential future contributors in the system, further undermining it. Convincing the public of usefulness of the new system and any reforms is an important step that should not be overlooked.

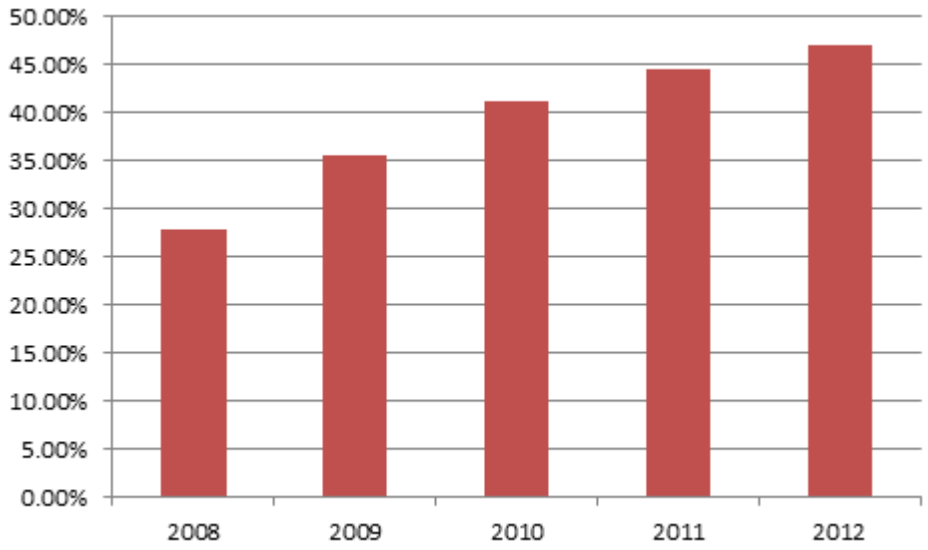
6.3 Public debt

In the last several years, Slovakia's public debt has been increasing steadily (Figure 14), from 27.9% to 44.7% in the past 4 years. This increase is likely to continue, with IMF's projection assuming a slight increase to 45.1%. However, given the government's planned deficit of 4.6% of GDP[13], the debt-to-GDP ratio is likely to rise above 50%. Even more troubling is the implicit SSD as yet not fully materialized. Due to the scheduled decrease of contribution rate to the II. pillar, the FF scheme will play a smaller role in the future. While this will prevent the implicit SSD from impacting the public finance too heavily in the foreseeable future, the SSD will likely rise to pre-2004 reform levels. Holzmann et al. (2004) estimate the social security debt in Slovakia to be at 241% GDP, based on price indexation and 2% discount rate. As of 2000, the government

[13] Source: Ministry of Finance of Slovak republic, Public Finance Budget for year 2012

economic institution IFP places the implicit SSD at 400% of GDP. Even gradual integration of this debt over a longer period of time into public finance will be painful and problematic.

Figure 15: Public Debt as % of GDP



Data source: IMF. Value for year 2012 is prediction, not actual value.

6.4 Higher interest rates

As the economies in Europe face a downturn, coupled with Slovakia's rating at A2 with negative outlook[14], the Slovak government bonds are at risk of slipping into the speculative investment territory. In such case, this would lead to increase in the Slovak bond yield rates and complications in debt financing. It bears to repeat that in the scenarios discussed in this paper, interest expenses were not included in calculations. Therefore, the deficits modeled in previous sections are underestimated and the analysis actually represents an optimistic estimate.

6.5 Other Criticism

Frequent ad-hoc changes to pension legislation that do not follow any clear underlying strategy reduce transparency and potentially undermine the financial viability of the system. The

[14] Moody's credit opinion: Government of Slovakia, May 2012

authorities should avoid such changes and, in particular, refrain from measures that tend to undermine the sustainability of the DB pillar. In this regard, there is general consensus among experts that several of the recent measures should be reversed[15]. Most importantly, participation in the DC pillar should be made mandatory for new labour market entrants, or, at the very least, participation should be made the default option. Until these changes are implemented, the transition period during which new labour market entrants are allowed to switch between pillars should be made less restrictive. Specifically, it should start on the first working day and continue for a sufficiently long period of consecutive work to allow workers to make an informed decision. For current workers, no switching between pillars should be allowed. To further strengthen the DB pillar, consideration will need to be given to measures such as raising the retirement age in line with gains in life expectancy and reducing the generosity of the pension formula. The increased pension contributions to the DB pillar from recently introduced modifications of the pension system should be used to reduce government debt.

7. Conclusion

In the last two decades, pension system reform became a pressing concern and topical issue in many countries across the world. In 1994, the World Bank published *Averting the Old Age Crisis: Policies to Protect the Old and Promote Growth,* recognising this issue officially, offering guidelines and proposing strategies to tackle it. With issues such as population aging, life expectancy increases and disproportionately generous benefits compared to contributions, pension system sustainability became a major concern. Slovakia is no exception to this; the entire pension system until recently relied exclusively on PAYG and only underwent first reformatory steps as late as 2005, with more reformatory steps pending and yet new being proposed. We have shown that although some progress was made in the field of sustainability, the current reform is insufficient in this regard. The focus of the empirical part of the thesis was discussion of four scenarios and their impact on public finance deficit in the next 100 years.

The first scenario was an approximation of today's state of pension system. It revealed that despite the structural reforms which had already been carried out, in the long term, the partial reform would not suffice to keep the system unburdened by excessive debt. Should no

[15] Source: IFP, 2011.

further steps be taken, Slovakia could find itself on the verge of bankruptcy by year 2050, by virtue of its social security deficits alone.

The next two scenarios were based on actual government propositions, most likely to be passed into a law within the next few years. The prognosis for these reforms, however, looks unoptimistic in the long run and only seems to alleviate the problem in the short run, representing a possible case of political moral hazard – it merely postpones the problem until 2020 when the SS deficits again start increasing at accelerating rate. As such, these would-be reforms serve only as ad hoc solution to a problem which is a symptom of a much bigger, systemic fault.

The fourth scenario is a compilation of proposed parametric changes to the system by known economic think-tanks. This scenario seems most promising from the perspective of long term sustainability, however, due to its ungenerous nature and substantial cuts necessary for its short term financing, it is also the scenario least likely to be implemented due to political reasons. It can, however, serve as an example and a benchmark for comparison and possible future setting of a reform.

8. Refernces:

Holzmann, R. (1998): Financing the Transition to Multi-pillar, HDNSP

Holzmann, R., Palacios, R., Zviniene, A. (2004): Implicit pension debt: Issues, Measurement, and Scope in International perspective, Human Development Network, The World Bank

Razin, B (2005): *Social Security Reform*, Cambridge University

Disney, R. (forthcoming) "How should we measure pension liabilities in EU Countries", in Evaluating the long-term sustainability of European pension systems. Kluwer.

World Bank (1994): *Averting the Old Age Crisis: Policies to Protect the Old and Promote Growth*, World Bank Policy Research Report, Oxford University Press

Golias, P. (1994): Dochodkova reforma na Slovensku: Argumenty pre a proti, INEKO

Ministry of work, social affairs and family of Slovak Republic (2005): National Strategy Report on Adequate and sustainable pensions, MPSVR SR

Odor, L. et al. (2004): Vplyv dochodkoveho sporenia na verejne financie a obcanov, IFP

Hufner, F. and Koske, I. (2008): 2008 Economic Review – The Slovak Republic, OECD Publishing

OECD (2011): Pensions at a Glance 2011: Retirement-income systems in OECD and G20 countries, OECD Publishing

IFP (2011): Analyza dlhodobej udrzatelnosti dochodkoveho systemu, IFP

Bleha, B. And Vano, B (2007), Prognóza vývoja obyvateľstva SR do roku 2025, Infostat, Výskumné demografické centrum

INEKO (2010): Analyza vplyvu penzijneho systemu na verejne financie, INEKO. Available as of 15/05/2012 at http://www.moodys.com/credit-ratings/Slovakia-Government-of-credit-rating-600011880

Moody's (2012): Credit opinion: Government of Slovakia, Global Credit Research. Available as of 15/05/2015 at http://www.moodys.com/credit-ratings/Slovakia-Government-of-credit-rating-600011880

Cavojec, J: Dochodky sa budu zvysovat o pevnu sumu. SME. Available as of 15/05/2012 at http://ekonomika.sme.sk/c/6377040/dochodky-sa-budu-zvysovat-o-pevnu-sumu.html

Porubsky, M (2012): Indexacia dochodkov o pevnu sumu? Nie, dakujem. IFP. Available as of 15/05/2012 at http://www.finance.gov.sk/Components/CategoryDocuments/s_LoadDocument.aspx?categoryId=8191&documentId=7193